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## Final Technical Report

Fourth SIAM Conference on Applications of Dynamical Systems  
May 18-22, 1997 Snowbird, Utah

The Fourth SIAM Conference on Applications of Dynamical Systems was designed to provide a forum for the continued interdisciplinary development of nonlinear dynamics and its applications. The conference was a great success -- we had an unprecedented attendance of over 592, including many of the leaders in the field from around the world, and from disciplines ranging from oceanography to molecular biology to quantum chaos. There was a sense of excitement in the air, perhaps because dynamical systems theory is finally living up to its promise to have a genuine impact on applied fields, and also because of our emerging understanding of the mathematical connections among many of the phenomena being studied.

Invited (plenary) presentations provided overviews of novel applications of nonlinear dynamics in such areas as manufacturing, fluid mechanics, neurobiology, oceanography, condensed-matter physics, and molecular biology. Also, for the first time in the history of this conference, we had a plenary session on teaching dynamics to undergraduates; this discussion of pedagogical issues was warmly received. Through the many minisymposia that were organized, there was sufficient critical mass of expertise in certain applications areas to promote a productive exchange of new ideas. In particular, there were "conferences within the conference" on fluid dynamics, ocean modeling, Josephson junction arrays, nonlinear optics, nonlinear waves, solitons, singular perturbation theory, stochastic resonance, computation, pattern formation, spatiotemporal chaos, Hamiltonian systems, and a host of other topics. Sessions for contributed papers and poster presentations provided a full range of opportunity for communicating recent developments.

Invited presentations were given by:

Christopher K. R. T. Jones, Brown University  
*"Lagrangian Transport in Mesoscale Ocean Structures"*

Raymond E. Goldstein, University of Arizona  
*"Intricate Interfaces and Modulated Membranes -- Their Geometry and Nonlinear Dynamics"*

Robert L. Devaney, Boston University  
*"Teaching Dynamical Systems in Undergraduates"*

Peter S. Constantin, University of Chicago  
*"Scaling Exponents in Turbulence"*

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Frank Moss, University of Missouri  
*"Stochastic Resonance in Sensory Biology"*

Leonid A. Bunimovich, Georgia Institute of Technology  
*"Bucket Brigade Production Lines"*

Charles S. Peskin, Courant Institute of Mathematical Sciences, New York University  
*"Biomolecular Motors"*

Charles M. Marcus, Stanford University  
*"Small Electronics and Quantum Chaos"*

Richard M. Murray, California Institute of Technology  
*"Nonlinear Control of Lagrangian Systems"*

Yoshiki Kuramoto, Kyoto University  
*"Temporal Chaos in Large Assemblies of Simple Dynamical Units"*

C. David Levermore, University of Arizona  
*"Complex Ginzburg-Landau Equations as Perturbations of Nonlinear Schrödinger Equations"*

There were 51 minisymposia, 37 contributed sessions; and two nonparallel poster sessions held on Tuesday and Wednesday evenings. Each poster session had over 60 poster presenters.

This conference represented the first activity sponsored by the recently created SIAM Activity Group in Dynamical Systems. Although early predictions estimated 250-300 participants, the conference drew 592 registered attendees, of which 436 were from the United States and 156 attended from foreign countries. Of the 592 total attendees, 38 were from government, 27 from industry, 527 from academia, representing 6%, 5%, and 89 % respectively.

Steven H. Strogatz and Mary Silber  
Conference Co-chairs

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